

WHAT IS CLAIMED IS:

1. An apparatus for controlling motion of an object, comprising:
a first actuator for moving an object;
an elastic-motion measuring unit for measuring elastic motion of the object; and
a control unit for controlling said first actuator based on an elastic motion measured by said elastic-motion measuring unit.
2. An apparatus according to Claim 1, further comprising:
a rigid-motion measuring unit for measuring rigid motion of the object,
wherein said control unit controls said first actuator based on a rigid motion measured by said rigid-motion measuring unit.
3. An apparatus according to Claim 1, further comprising:
a second actuator for suppressing elastic motion of the object,
wherein said control unit controls said second actuator based on an elastic motion measured by said elastic-motion measuring unit.
4. An apparatus according to Claim 1, wherein said control unit comprises a prediction unit for predicting an elastic motion of the object caused by said first actuator, and controls said first actuator based on prediction made by said prediction unit.
5. An apparatus according to Claim 3, wherein said control unit

comprises a prediction unit for predicting an elastic motion of the object caused by said first actuator, and controls said second actuator based on a prediction made by said prediction unit.

6. An apparatus according to Claim 1, wherein said elastic motion measuring unit comprises a piezoelectric element.

7. An apparatus according to Claim 3, wherein said second actuator comprises a piezoelectric element.

8. An exposure apparatus for exposing a substrate to a pattern of an original, said exposure apparatus comprising the apparatus defined in Claim 1.

9. An exposure apparatus according to Claim 8, wherein the apparatus defined in Claim 1 includes a stage for holding one of the substrate and the original.

10. A device manufacturing method, comprising a step of exposing a substrate to a pattern of an original using the apparatus defined in Claim 1.

11. An apparatus for controlling motion of an object, comprising:
a first actuator for moving an object;
a second actuator for suppressing elastic motion of the object; and
a control unit for controlling said second actuator based on a prediction of the elastic motion of the object caused by said first actuator.

12. An apparatus according to Claim 11, further comprising:
an elastic-motion measuring unit for measuring elastic motion of the
object,

wherein said control unit controls said second actuator based on an
elastic motion measured by said elastic-motion measuring unit.

13. An apparatus according to Claim 11, further comprising:
a rigid-motion measuring unit for measuring rigid motion of the
object,

wherein said control unit controls said first actuator based on a rigid
motion measured by said rigid-motion measuring unit.

14. An exposure apparatus for exposing a substrate to a pattern of an
original, said exposure apparatus comprising the apparatus defined in Claim
11.

15. An exposure apparatus according to Claim 14, wherein the
apparatus defined in Claim 11 includes a stage for holding one of the
substrate and the original.

16. A device manufacturing method, comprising a step of exposing a
substrate to a pattern of an original using the exposure apparatus defined in
Claim 14.